Climate change and energy challenges facing developing countries - with special focus on Sub-saharan Africa

Nygaard, Ivan

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Climate change and energy challenges facing developing countries

with special focus on South Saharan Africa

Ivan Nygaard, Energy Researcher, PhD
UNEP Risoe Centre, RISØ-DTU

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Outline of Presentation

- Climate change
- Main energy challenges
- Persisting dilemmas
- Core areas for actions

Climate Change

- Numerous changes in climate are **already** being observed – the most significant lie ahead
- Greenhouse gas emissions have **most likely** caused most of the observed increase in temperature
- GHG Emissions from the **energy sector** are
  - the main anthropogenic source
  - projected increases are highest
  - and therefore need to be reduced

(IPCC 2007)

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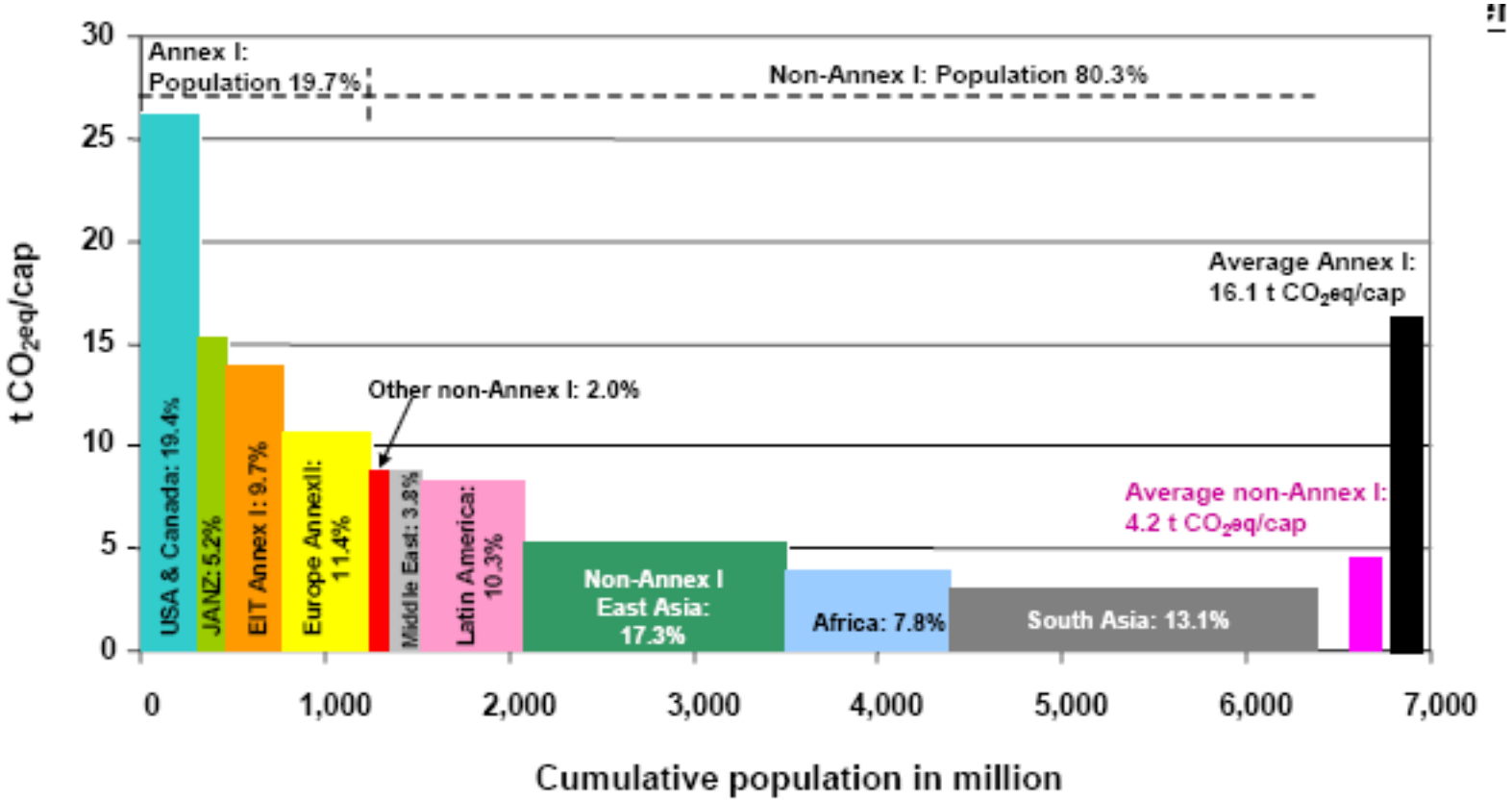
Regional per capita GHG emissions

(all Kyoto gases, including those from land-use)



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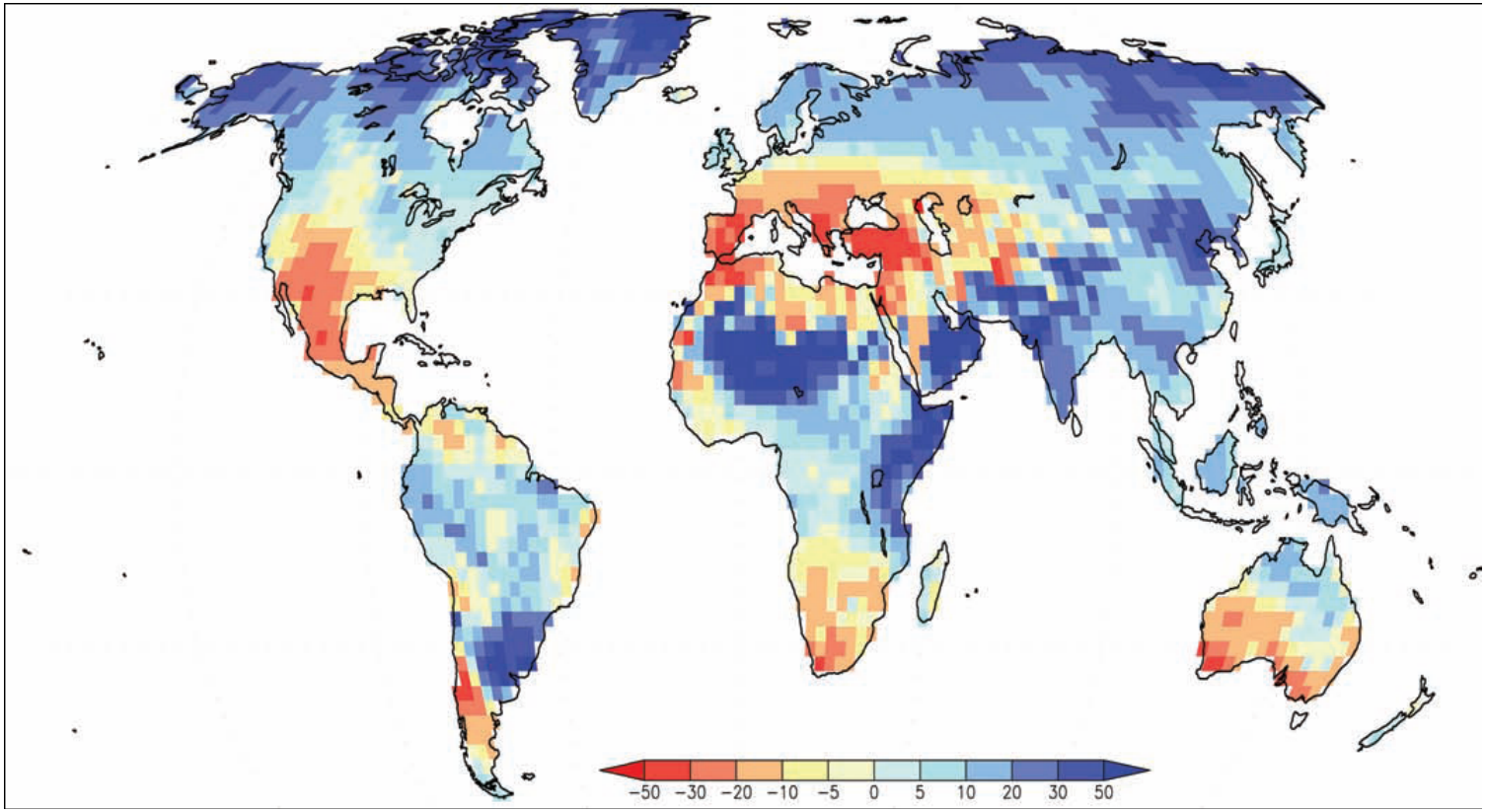
Change in annual runoff in percent

(1981-2000 compared to 2081-2100)



IPCC (Nohara et al, 2006)

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Energy and climate change

- Climate change is mainly caused by energy consumption in high income countries
- Negative impacts of climate change are most severe in low income countries and island communities
- Technical mitigation options are available but at higher cost
- Mitigation measures should be implemented in high and medium income countries
- Priority in low income countries should be:
  - Increase in energy production for poverty reduction and
  - adaptation to climate change

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Energy for poverty reduction

Millennium Development Goals

1. Extreme Poverty & Hunger (halve by 2015 no. on <1$)
2. Universal Primary Education (all kids in primary by 2015)
3. Gender Equality and women's empowerment (equal access to education)
4. Child Mortality (reduce by 2/3 child mortality by 2015
5. Maternal Health (reduce by 75% maternal mortality)
6. HIV/AIDS, Malaria etc. (by 2015 have reversed spread)
7. Environmental Sustainability (stop unsustainable resource exploitation and halve number of people without safe water)
8. Develop a global partnership for development

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Energy for poverty reduction - main challenges

- Large share of people are dependent on fuel wood for cooking
- Historical low access rate to electricity
- Power shortage in established systems
- Rapidly increasing oil prices

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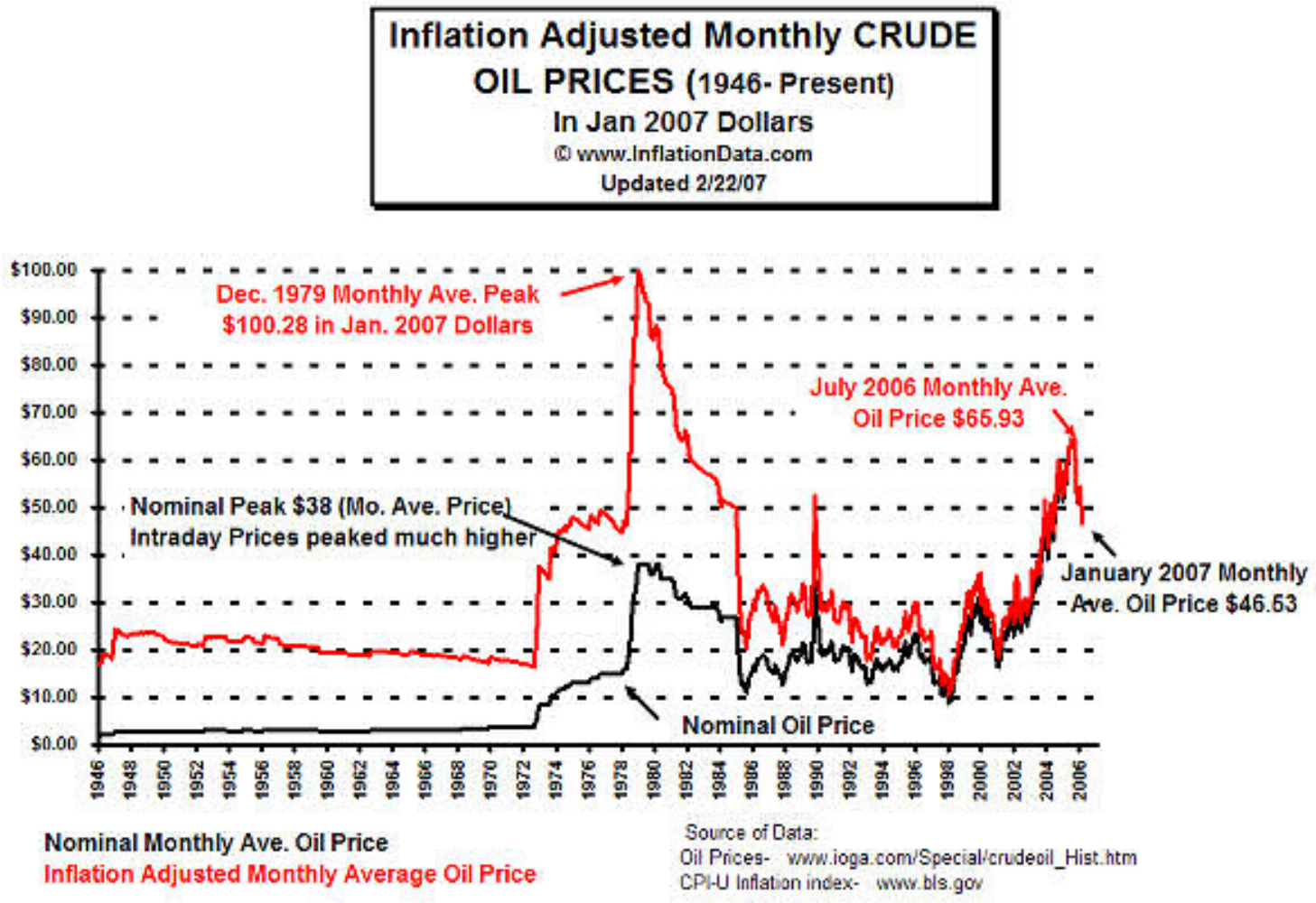
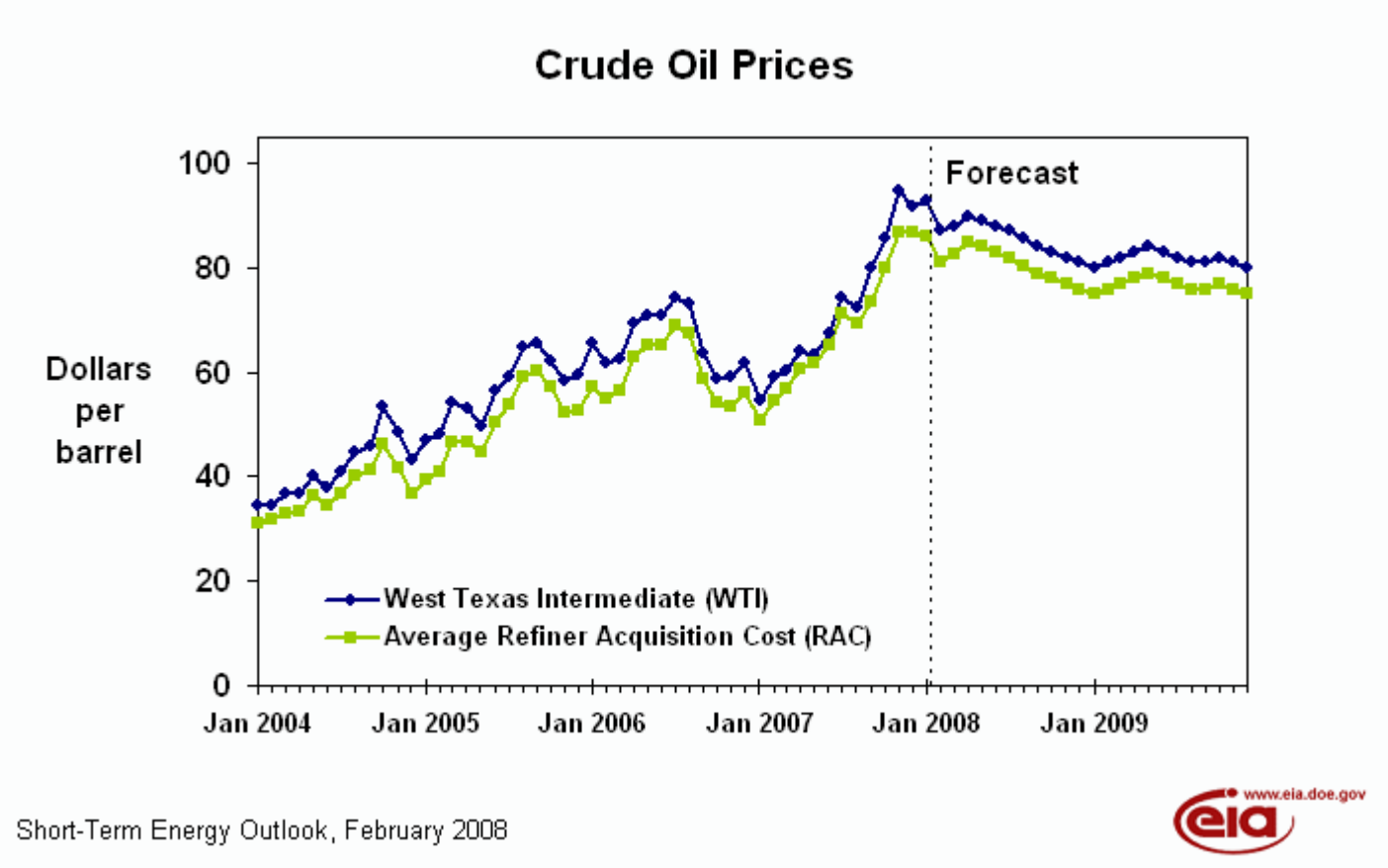
Increasing oil prices

Actual prices close to 1979 level



-and are expected to remain high

Oil prices forecast, DOE



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Persistent dilemmas in the energy sector

- Renewable energy or fossil fuels
- Decentralised solutions or large scale infrastructure
- Public or private ownership

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Dilemma 1: Renewable energy or fossil fuels for electricity

- Important to opt for the cheapest solutions to the rural poor and to use renewables where adequate
  - Solar PV should only be used where economic feasible
  - Important to compare the quality of service from PV, grid connection
- Small scale hydropower
- Biomass (cogeneration on waste)
- Large hydropower an option in some places in Africa with low population density
- Wind energy an option at good locations
- Biofuels – from jatropha, bagasse, waste products ??

Depending on context. Level of oil prices is essential, while CDM credits slightly advance investment in renewable energy

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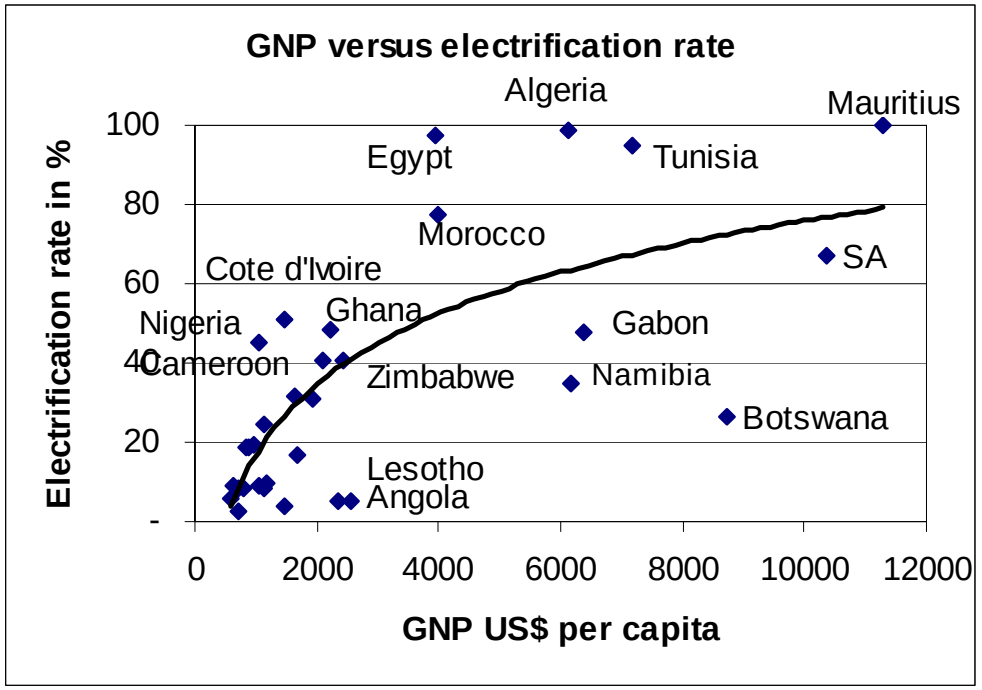
Dilemma 2: Large scale infrastructure or decentralised supply

- Close relationship between cost of electricity (hydropower) and rural electrification rates
- Cheap electricity from hydro, gas and regional interconnections is an important precondition for achieving high access rates
- Decentralised solutions outside grid connected areas to build up demand



Dilemma 3:
Public or private ownership

- Power sector reform has not increased private investment in infrastructure as anticipated. Rather uncertainty has led to drop in investment. (drought, power cuts, emergency capacity)
  - Creation of stable and reliable institutional and regulatory frameworks (regulators, stock markets) are one of the means to increase investments
    - Introduction of Kengen on the Kenyan Stock market
- Power sector reforms were not designed to increasing rural electrification. History shows that the most successful electrification programmes were implemented in countries with state owned utilities
  - Morocco, Thailand, Egypt
  - Stable and committed effort from governments and utilities are needed to ensure higher electrification rates

Core Areas for International Action

- Systematic support to energy development as a part of poverty reduction and economic development **strategies**
- Systematic inclusion of energy in design and cost of all **development assistance** addressing other sector MDGs
- Commitment to long term **financing** of energy sector development
- Increase global **funding** for energy poverty programs focusing on increased access

And acknowledging that there is no simple - one size fits all - solutions

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Important - if not necessary - preconditions ?

- Good governance and political stability
- Long-term political commitment to energy priorities
- Stable and reliable institutional and regulatory frameworks

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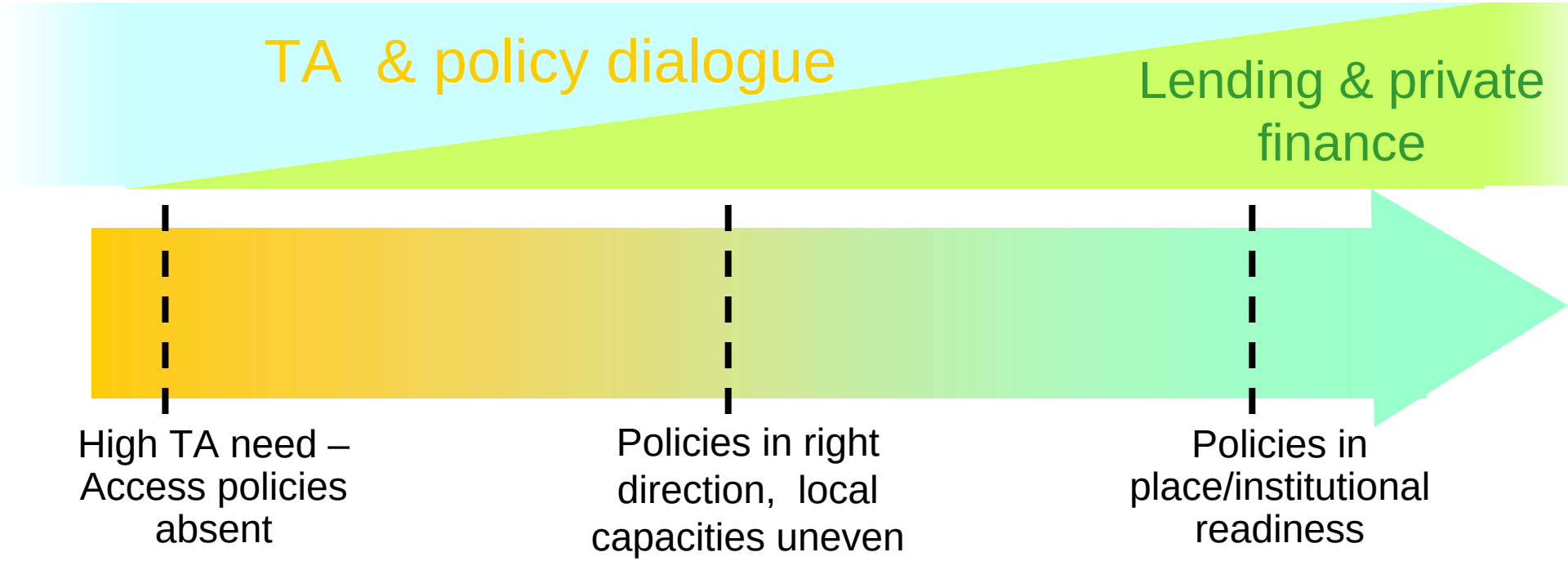
Long term engagement → patience required!
Persistence, not perfection, is the key.



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THANK YOU FOR THE ATTENTION

Time to choose path

No Action

Joint Action

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